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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/575,437	04/11/2006	Dirk Burdinski	GB03 0186 US1	1847

24738 7590 05/12/2010

PHILIPS INTELLECTUAL PROPERTY & STANDARDS
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EXAMINER	
BANH, DAVID H	

ART UNIT	PAPER NUMBER
2854	

MAIL DATE	DELIVERY MODE
05/12/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/575,437	BURDINSKI ET AL.	
	Examiner	Art Unit	
	DAVID BANH	2854	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 March 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March 1, 2010 has been entered.

Response to Arguments

2. Applicant's arguments with respect to claims 1-4 have been considered but are moot in view of the new ground(s) of rejection.

Arguments directed to the Adams et al. reference, the Schueller et al. reference and the combination thereof are not persuasive. Applicant argues that Adams et al. provides not motivation to provide a barrier layer that prevents molecules of the ink from penetrating the elastomeric stamp. Examiner disagrees. Paragraph 25 of Adams et al. teaches that it is desirable to prevent the PDMS stamp from swelling and to have a solvent which readily dewets from the PDMS surface. Thus, providing a PDMS surface more resistant to absorption of the solvent and ink would improve the invention of Adams et al.

Applicant argues that the modification of Adams et al. by Scheuller et al. does not teach or suggest "removing the elastometric stamp from the surface of the first substrate such that none of the ink remains on the contact surface of the protruding

feature due to the acts of contacting, transferring all of the ink from the contact surface and removing...". The rejection relies upon replacing the blowing step of Adams et al. with wiping step, which consists of contacting a surface to a substrate, transferring ink from the surface to the substrate, and removing the surface from the substrate. Adams et al. teaches that the blowing step with "substantially no molecular ink being left on each stamp surface." This provides a teaching and suggestion of leaving none of the ink on the contact surface.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adams et al. (US PG Pub 2005/0120902) in view of Cherniavskaya et al. (Langmuir 2002, 18, 7029-7034, provided as NPL by Applicant) and Schueller et al. (US PG Pub 2003/0047535).

For claim 1: Adams et al. teaches a method of patterning a surface of a substrate **18** with ink **15** (see paragraph 25), the method comprising the act of providing an elastomeric stamp **10** having a bulk surface **11** and at least one protruding feature **16** protruding from the bulk surface **11** (see Fig. 1A), the protruding feature **16** having a contact surface **14** and an edge **19** extending from the contact surface **14** extending from the bulk surface **11** (see Fig. 1A), supplying a solution of the ink and a solvent to

the surface of the stamp (see Fig. 1A, and paragraph 8, "a solution of the molecular ink and a solvent is applied to the surface of the stamp structure"), removing the solvent (paragraph 8, blow drying) wherein the blow drying causes removal of the solvent and removes all of the ink from the surface of the stamp (see paragraph 8, the dewetting of the solvent into the recess and subsequent blow drying removes the solvent, while simultaneously removing the ink from the surface of the protruding features such that substantially no ink remains on the surface of the protruding features), providing a second substrate and contacting the surface of the protruding feature with the surface of the second substrate (page 1, paragraph 8) to transfer ink from the edge of the protruding features to the surface of the substrate (see Fig. 1A). The surface of the substrate must necessarily have a higher affinity to ink than the surface of the stamp for printing to take place.

Adams et al. does not explicitly teach the provision of a barrier layer on the protruding feature surface and the bulk surface. However, Adams et al. does teach that the material of the stamp surface and the choice of solvent and molecular ink act in such a way as to prevent the majority of the solvent from entering the stamp and in this way functions similarly to a barrier layer (see paragraph 8, and paragraph 25, the preference to ethanol solvent with a PDMS stamp). Cherniavskaya et al. teaches providing a barrier layer, being hydrophobic pads and particularly, a PDMS surface structure that is enhanced with optimized solution chemistry for being hydrophobic and further resisting swelling (see page 7033, the second full paragraph of the second column, enhanced hydrophobic surface structure would be a barrier layer, the barrier

layer to be the entire surface of the stamp as swelling of the stamp is undesirable in Adams et al. and analogous Cherniavskaya et al.). It would have been obvious to one of ordinary skill in the art at the time the invention was made to enhance the hydrophobic nature of the PDMS surface for the purpose of improving dewetting and preventing swelling of the PDMS stamp.

The barrier layer of Cherniavskaya et al. prevents molecules of the ink and solvent from penetrating the stamp.

The combination of Adams et al. and Cherniavskaya et al. does not teach the provision of a first substrate with a surface having higher affinity for the ink than the barrier, contacting the contact surface of the protruding feature with the first substrate, transferring all of the ink from the contact surface of the first substrate and removing the stamp from the surface of the first substrate such that none of the ink remains on the contact surface of the protruding feature of the stamp. However, Schueller et al. teaches in a micro-contacting printing of a stamp on a substrate that after ink has been applied to the surface of a stamp, the ink is dried by use of gas jets, in other words, blow drying, or instead, absorbent material may be pressed into contact with the stamp to dry it (paragraph 51). This drying by pressing to absorbent material would involve the steps of providing a first substrate having a higher affinity to ink than the barrier layer, contacting the contact surface of the protruding feature with the surface of the first substrate, transferring ink from the contact surface of the protruding feature to the surface of the first substrate and removing the elastomeric stamp from the surface of the first substrate.

It would have been obvious to one of ordinary skill in the art at the time the invention to use an absorbent substrate to wipe the ink off of the surface of the protruding feature as an equivalent to drying the stamp with gas jets to remove all of the ink from the surface of the protruding feature for the purpose of producing a cleaner stamped image.

For claim 2: The combination of Adams et al, Cherniavskaya et al. and Schueller et al. teaches the method of claim 1. Schueller et al. teaches further the act of removing a part of the surface of the second substrate (paragraph 59, post processing comprising etching), the part being defined by the ink pattern (paragraph 74, etching occurs in portions not protected by SAMs). It would have been obvious to one of ordinary skill in the art at the time the invention was made to subject the printed substrate to post processing involving etching to produce a finished circuit of the appropriate size and having imprinted features of an appropriate depth.

For claim 3: The combination of Adams et al., Cherniavskaya et al. and Schueller et al. teaches the method of claim 2 and Schueller et al. further teaches that the removing step comprises etching (paragraph 59).

For claim 4: The combination of Adams et al., Cherniavskaya et al. and Schueller et al. teaches the method of claim 1 and Adams et al. teaches that the act of providing the surface of the second substrate is performed for a period of time to allow lateral movement over the surface of the second substrate of the ink transferred by the edge (see Fig. 1A of Adams, the ink is transferred from the stamp to the substrate, and has some lateral width on the substrate; since all of the ink is initially on the stamp,

there is at least some lateral movement of this ink and since movement cannot occur instantaneously, there is some time frame connected with this movement).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID BANH whose telephone number is (571)270-3851. The examiner can normally be reached on M-F 9:30AM - 8PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on (571)272-2258. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DHB

/Judy Nguyen/
Supervisory Patent Examiner, Art Unit 2854